

CLAIMS

1. A differential imaging method using a THz wave comprising: generating THz waves (4) on two different 5 wavelengths within a frequency range of about 0.5 to 3 THz; irradiating a subject matter (10) with the THz waves on two wavelengths to measure their transmittances; and detecting the presence of a target having wavelength dependence on the absorption of the THz wave from a difference of their 10 transmittances.

2. The differential imaging method according to claim 1, comprising: scanning two-dimensionally a surface of the subject matter with each of the THz waves (4) on two 15 different wavelengths; and displaying two-dimensionally an image of a position where the transmittances of the two wavelengths differ.

3. A differential imaging apparatus using a THz wave comprising: a THz wave generation device (12) which generates THz waves (4) on two different wavelengths within a frequency range of about 0.5 to 3 THz; a transmission intensity measurement device (14) which irradiates a subject matter (10) with the THz waves (4) on two wavelengths to 20 measure their transmittances; and a target detection device (16) which calculates transmittances from measured 25 transmission intensity and detects the presence of a target

having wavelength dependence on the absorption of the THz wave from a difference of their transmittances.

4. The differential imaging apparatus according to
5 claim 3, comprising: a two-dimensional scanning device (18) which scans two-dimensionally a surface of the subject matter with each of the THz waves (4) on two different wavelengths; and an image display device (20) which displays two-dimensionally an image of a position where the transmittances
10 of the two wavelengths differ.

5. The differential imaging apparatus according to
claim 3, wherein the THz wave generation device (12) has a
nonlinear optical crystal (1) which can generate a THz wave
15 by a parametric effect; a pump light incidence apparatus (11) which allows a pump light (2) to be incident upon the nonlinear optical crystal to generate an idler light (3) and the THz wave (4); and a switching device (13) which switches the generated THz wave (4) to two different wavelengths.
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6. The differential imaging apparatus according to
claim 3, wherein the transmission intensity measurement
device (14) comprises a splitter (14a) which splits the THz
wave (4) into a measurement light (4a) and a reference light
25 (4b) in a fixed ratio; a condensing lens (14b) which focuses the measurement light onto the subject matter (10) to apply the measurement light thereto; and an intensity measurement

device (15) which measures intensity of the measurement light and reference light that have passed through the subject matter.